



# 10

## #398943 v1 - A34584-A-PCT-USA Sequence Listing

## SEQUENCE LISTING

<110> Fisher, Paul B.  
Leszczyniecka, Magdalena

<120> GENES DISPLAYING ENHANCED EXPRESSION DURING CELLULAR SENESENCE AND TERMINAL  
CELL DIFFERENTIATION AND USES THEREOF

<130> A34584-A-PCT-USA (070050.1664)

<140> PCT/US00/02920

<141> 2000-02-02

<150> US 09/243,277

<151> 1999-02-02

<160> 51

<170> FastSEQ for windows Version 4.0

<210> 1

<211> 674

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> 534, 590

<223> a or g or c or t

<400> 1

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cagcatgtcc	aaatcgatgt	ggatgtttcc	aagcctgacc	tcacggctgc	cctgcgtgac	180
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gcaaagcagg	agtccactga	gtaccggaga	caggtgcagt	ccctcacctg	tgaagtggat	360
gcccttaaaag	gaaccaatga	gtccctggaa	cgccagatgc	gtgaaatgga	agagaacttt	420
gccgttgaag	ctgctaacta	ccaagacact	attggcccgc	ctgcaggatg	agattcagaa	480
tatgaaggag	gaaatggctc	gtcaccttcg	tgaataccaa	gacctgctca	atgntaagat	540
ggcccttgac	attgagattg	ccacctacag	gaagctgctg	ggaaggcgan	gagagcagga	600
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<211> 678

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> 566, 669

<223> a or g or c or t

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gattactgaa	gatgttcagg	gtaaaaactg	cctgactaac	ttccatggca	tggatcttac	180
ccgtgacaaa	atgtgttcca	tgggtcaaaaa	atggcagaca	atgattgaag	ctcacgttga	240
tgtcaagact	accgatgggt	acttgcttcg	tctgttctgt	gttggtttta	ctaaaaaacg	300
caacaatcag	atacgggaaga	cctcttatgc	tcagacacaa	caggtccgcc	aaatccggaa	360

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gaagatgatg	gaaatcatga	cccgagaggt	gcagacaaat	gacttgaaag	aagtgggtcaa	420
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tctccatgat	gtcttcgta	gaaaagtaaa	aatgctgaag	aagcccaagt	ttgaattggg	540
aaagctcatg	gagcttcacg	gtgaanggca	gtagtctctg	aaaaagccac	ttggggacga	600
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 <221> unsure  
 <222> 656  
 <223> a or g or c or t

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gggggaagtg	acagcacaga	agaggccaga	gaacagcctc	ctggaggaga	ccctacactt	300
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tatcattaaa	cagaggataa	gagatcaggc	ttgggatgat	gtagtacgta	aagaaaaacc	420
taaagaggat	gcatatgaat	ataaaaagcg	tttaacctta	gaccatgaga	agagtaaatt	480
gagccttgct	gaaatttatg	aacaggagta	catcaaaactc	aaccagcaaa	aaacagcaga	540
agaagaaaaat	ccagaacatg	tagaaaattca	gaagatgatg	gattccctct	tcttaaattg	600
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aatctgcca						670

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 <211> 675  
 <212> DNA  
 <213> Homo sapiens  
  
 <220>  
 <221> unsure  
 <222> 530, 534, 650, 651, 655  
 <223> a or g or c or t

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ggtagtgaag	aaatgggcca	gggcgagtc	agctccagtc	ccagagagct	cctctctaac	180
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ttgtgacggg	taggaggata	ggaagacagg	gggccccaac	ctgggattgc	tgagcaggga	300
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ggcgtgaacc	tgggaaggaa	aagttgcagg	tgagcccaag	attgcgcccc	cttgcactcc	600
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<210> 5  
 <211> 460  
 <212> DNA  
 <213> Homo sapiens  
  
 <220>  
 <221> unsure  
 <222> 411, 412, 415, 416, 423, 430, 433, 439, 442, 446, 452, 454,

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456, 457

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&lt;400&gt; 5

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tgtaatccca	gcacttaggg	aggccgagga	gggcagatca	cgaggtcagg	agatcgaaac	180
catcctggct	aacacggtga	aaccccgctc	ctactaaaaa	atacaaaaaa	ttagctgggc	240
gcagaggcac	gggcctgtag	tcccagctac	tcaggaggcg	gaggcaggag	aatggcgta	300
acccgggagg	cggagggtgc	agtgagccag	gattgtgcga	ctgcactcca	gcctgggtga	360
cagggtgaaa	cgccatctca	aaaaataaaa	attaaaaaaa	aaaaaaaaaa	nntcnngggg	420
ggncccggtg	ccnatttcnc	cntatnggga	gncntnncaa			460

&lt;210&gt; 6

&lt;211&gt; 445

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 6

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ggtgctgaaa	tccggcatgt	tcttgtcaca	ctgggtgaga	agatgacaga	ggaagaagta	180
gagatgctgg	tggcagggca	tgaggacagc	aatggttgta	tcaactatga	agagctcgtc	240
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tgatgaattt	gtatctagcc	taaaagtttc	ctaggctttc	ttgtctcagc	aactttccca	360
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ccctcggaag	aaaaaaaaaa	aaaaa				445

&lt;210&gt; 7

&lt;211&gt; 666

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; unsure

&lt;222&gt; 483, 498, 527

&lt;223&gt; a or c or g or t

&lt;400&gt; 7

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aataaattgt	tttgagtgtt	ttttgagccc	cagacaaata	atgttttaaa	gttatcccct	180
tgctacttta	ctgatacctt	tatcattcct	gagacagttt	gctaatttaa	aaatgtagca	240
ttccatttgt	atttatattt	ctcccttgcc	aaaaagattt	tctaatactg	cttgtaggag	300
ccagagaaag	atccaaaaca	ctactcagct	ctcttgcaat	gaggaaattt	ttccccctac	360
attgactcct	ggcctacatc	agccaaactt	aaccttggtg	gggtttggat	ttgatagcca	420
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ttttgtctag	tatatgatag	ttctgtctgat	ggtttggtta	ttgggcagac	atatcttcat	600
taagagtttt	tggaaaactc	atcaaattcg	atgaatacat	tttcttcata	acccattgga	660
aataatc						666

&lt;210&gt; 8

&lt;211&gt; 409

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 8

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aagcccccat	tcgtataata	attacatcac	aagacgtctt	gcactcatga	gctgtcccca	180
cattaggctt	aaaaacagat	gcaattcccc	gacgtctaaa	ccaaaccact	ttcaccgcta	240
cacgaccggg	ggtatactac	ggtcaatgct	ctgaaatctg	tgagagcaaac	cacagtttca	300

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tatagcacc cctctacccc ctctagagca aaaaaaaaaa aaaaaaaaaa 409

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<211> 667  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 436, 663  
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tctgcagtgg aaaaaaagcc cacatttgag gtggctcatc tagacctggc aagaatgtat 180  
atagaagcag gcaatcacag aaaagctgaa gagaattttc aaaaattgtt atgcatgaaa 240  
ccagtggtag aagaaacaat gcaagacata catttccact atggctcgggt tcaggaattt 300  
caaaagaaat ctgacgtcaa tgcaattatc cattatttaa aagctataaa aatagaacag 360  
gcatcattaa caagggataa aagtatcaat tctttgaaga aattggtttt aaggaaactt 420  
cggagaaagg cattanactg gaaagcttga gcctccttgg gttcgtctac aaattggaag 480  
gaaatatgaa tgaagccctg gagtactatg agcgggccct gagactggct gctgactttg 540  
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ggnatga 667

<210> 10  
<211> 672  
<212> DNA  
<213> Homo sapiens

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<221> unsure  
<222> 585  
<223> a or c or g or t

<400> 10  
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ctttttcttc agccattcca gcatagagaa caaaccttat ggaaacagga atgtcaattg 240  
tgtaatcatt gttctaatta ggtaaataga agtccttatg tatgtgttac aagaatttcc 300  
cccacaacat cttttatgac tgaagttcaa tgacagtttg tgtttggtgg taaaggattt 360  
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gctgactgtt cttgtggatc ttgtgtccag ggacatgggg tgacatgcct cgtatgtgtt 480  
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tcacatcccc acccagggcc cggttttact aagtgtctgc cctanattgg gtcaaaggag 600  
gtcatccaac tgactttatc aagtggaatt gggatatatt tgatatactt ctggctaaca 660  
acatgggaaa ag 672

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<211> 672  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 585  
<223> a or c or g or t

<400> 11  
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ctttttcttc agccattcca gcatagagaa caaaccttat ggaaacagga atgtcaattg 240
tgtaatcatt gttctaatta ggtaaataga agtccttatg tatgtgttac aagaatttcc 300
cccacaacat cctttatgac tgaagttaa tgacagtttg tgtttggtgg taaaggattt 360
tctccatggc ctgaattaag accattagaa agcaccaggc cgtgggagca gtgaccatct 420
gctgactgtt ctgtggtatc ttgtgtccag ggacatgggg tgacatgcct cgtatgtgtt 480
agaggggtga atggatgtgt ttggcgctgc atgggatctg gtgcccctct tctcctggat 540
tcacatcccc acccagggcc cggttttact aagtgtctgc cctanattgg gtcaaaggag 600
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acatgggaaa ag

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 <211> 669  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 587, 595, 600, 660, 662  
 <223> a or c or g or t

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aagaacatga caaccaagca aatgtgagga gtctggtgac ctggggcaac tttgcctgga 180
tgtattacca catgggcaga ctggcagaag ccagactta cctggacaag gtggagaaca 240
tttgcaagaa gctttcaaata cccttcgcct atagaatgga gtgtccagaa atagactgtg 300
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ttcccctaag gcaggctgtc cgcttaaatc cagataatgg atatattaag ggtctccttg 540
ccctgaagct tcaggatgaa ggacaggaaa cttgaaggag aaaagtncat tgaanaactn 600
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tntgggata

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<210> 13  
 <211> 702  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 530, 585, 600, 616, 654, 702  
 <223> a or c or g or t

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tatcaggaag atatcggcga cattgtggac ttggcttcag tgaggtagaa gaccatgatg 180
gagaagggtga tgtggctgga gatgatgatg atgacgatga tgattcacct gatcctgaaa 240
gtccagatga ttctgaaagc gattcagagt cagagaaaga agaactctgct gaagaactcc 300
aagctgctga gcaccctgat gaagtggagg atcccaaaaa caaaaaagat gcaaaaaagca 360
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attaaaagta agccttattg ttacaatgca cagtggagga ctgcttatag agcacagacc 480
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atgccatggg ttacactttt atgggcatga ctataccatt ttgnaaaga gtagagttn 600
ataaaaatag aaatanntcc agtactcact tccttctatt agcatctcac cctntaatc 660
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<210> 14  
 <211> 312  
 <212> DNA

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<213> Homo sapiens

<400> 14

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tggtgctgca ccagcaggag gtcctgcccc ctccactgct gctgctccag ctgaggagaa 180
gaaagtggaa gcaaagaaag aagaatccga ggagtctgat gatgacatgg gctttggtct 240
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<210> 15

<211> 391

<212> DNA

<213> Homo sapiens

<400> 15

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acatgttgcc aatcagagga tgtgatcaca attcgttaata aaggatccag gagtttttgt 180
agataggtag caccatatac cttgaaacag aatgtcatta ttttactggc caagctgttg 240
cctcgggaaga gagtctgcat ggagtctgcc aattctactt ctttagaaaa catgttccag 300
agcagttggt agagtaaatg ccgagaatca aacagagtaa ccagaactcg aggggggggccc 360
cggtagccaa ttcgccctat agtgagtcgt t 391
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<210> 16

<211> 720

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> 6, 7, 359, 383, 449, 456, 459, 473, 501, 504, 515, 518, 528, 532, 535, 538, 549, 562, 567, 568, 577, 579, 601, 603

<223> a or c or g or t

<221> unsure

<222> 614, 618, 621, 625, 633, 636, 641, 678, 683, 691, 708

<223> a or c or g or t

<400> 16

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ccatcttgag gatgtagggg attatgctgt ctatcgaaac attgccaatg agaccagtaa 180
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ccacagctca gcaaaggctc ctgggggtccc gtctgtattg caccagaatc aaaccaacng 360
gatccacctt ccacccacct ttnttttctg atttcaacag ttcctcttat agaaatttat 420
catgagaaaa aaccaaataa gtccaaaang tatgtncana tgggttcctt tcnctctggt 480
aatccaactt tcctaacccc nccnccaaaa aaaanctngg aattcttnac cngngngnca 540
ccttaaggng gaagccttca tnggaannac ttgctanana ctcatttaaa aaaccgatta 600
ntnccaaccc tgnnttttnt gncccnngaa aanacntccc ntgacatatg gctcaaataa 660
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<210> 17

<211> 205

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> 158, 159, 161, 163, 176, 182, 186, 189, 191, 193, 197, 1699, 200, 202, 203

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&lt;400&gt; 17

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cagcattccc	cctcaaacct	aaaaaaaaaa	aaaaaaaaant	ngnggggggg	cccgncccc	180
anttcnccnt	ntngggngnn	gnntt				205

&lt;210&gt; 18

&lt;211&gt; 691

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; unsure

&lt;222&gt; 479

&lt;223&gt; a or c or g or t

&lt;400&gt; 18

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catggatctg	gtaggggggaa	aatgtgtatt	ttattacatc	tttcacattg	gctattttaaa	180
gacaaagaca	aattctgttt	cttgagaaga	gaatattagc	tttactgttt	gttatggctt	240
aatgacacta	gctaatatca	atagaaggat	gtacatttcc	aaattcacia	gttgtgtttg	300
atatccaaag	ctgaatacat	tctgctttca	tcttggtcac	atacaattat	ttttacagtt	360
ctcccaaggg	agttaggcta	ttcacaca	ctcattcaaa	agttgaaatt	aaccatagat	420
gtagataaac	tcagaaattt	aattcatgtt	tcttaaattg	gctactttgt	cctttttgnt	480
attaggggtg	tatttagtct	attagccaca	aaattgggaa	aggagtagaa	aaagcagtaa	540
ctgacaactt	gaataataca	ccagagataa	tatgagaatc	agatcatttc	aaaactcatt	600
tcctatgtaa	ctgcattgag	aactgcatat	gtttcgtcta	tatatggggt	tttccatttg	660
cgaatgggtc	cattctctct	ccggactttt	t			691

&lt;210&gt; 19

&lt;211&gt; 483

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 19

tctagaacta	gtggatcccc	cgggctgcag	gaattcggca	cgaggtttta	agta <del>ct</del> ctga	60
aattgatctg	tgatcaataa	tactaatatg	ttatctttta	ccgtattctg	cctctcacta	120
ttgatittaa	ttagttagga	gtatttgagc	tgttatttct	tgagcttaat	atttttttag	180
agttaactct	ttaaggagat	aatcatggct	gtagacaagg	ccagggctgg	ctgacgtgcc	240
ttagaaagtt	tgaatgcaat	aaagcgggtg	ttggcggtct	cctgcattgt	agtgcggggt	300
acaaatgcta	attgtttccg	caactgggtg	cagcagatga	gccgcccact	acagacggct	360
actgcccagg	gacctgcccc	ggccccaccc	aagggtctcc	aagggttgag	atttctgcag	420
acctatagcc	agcacactta	gtcctgccc	atataagagt	cctcttcggg	aagcttttga	480
taa						483

&lt;210&gt; 20

&lt;211&gt; 589

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; unsure

&lt;222&gt; 556, 558, 587

&lt;223&gt; a or c or g or t

&lt;400&gt; 20

gcacgagtcg	aaatgtacat	tggtgattct	gaagcttata	tcggagcaga	cattaaagac	60
aaattaaaa	gttatgactt	tgatgtgcat	acaatgaaga	cactaaaaaa	cattatttca	120
cctccgtggg	atttcagggg	atttgaagta	gaaaaacaga	ctgcagaaga	aacggggctt	180
acgccattgg	aaacctcaag	gaaaactcca	gattccagac	cttccttgga	agaaaccttt	240

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```

gaaattgaaa tgaatgaaag tgacatgatg ttagagacat ctatgtcaga ccacagcacg 300
tgactccagt cagtggctct ggtcccactg tcccagtgta ggtagtatt ccttcacatc 360
ctctccatgg cttaagaatg tcccacttcc taacgtgact ccaaactgca tctctacatt 420
taggaacaga gacccgcctt aagagactgg atcgcacacc ttgcaacag atgtgttctg 480
atttcttgaa cctacaaaat agttatacat agtggataaa agaaggtaaa ccatcaaaaa 540
aaaaaaaaaa aaaccncngg gggggcccg gccaatttg cccttangg 589

```

<210> 21  
 <211> 713  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 389, 396, 400, 409, 418, 429, 463, 468, 520, 556, 575, 591,  
 594, 613, 635, 641, 650, 666, 680, 682, 700, 704  
 <223> a or c or g or t

```

<400> 21
aattcaagt cctgattaat tgaggtggca acatagtttg agacgagggc agagaacagg 60
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agtatacaga gagttcacct ctactctgcc ctccctcatag tcataatgta gcaagtaaag 180
aatgagaatg gattctgtac aatacactag aaaccaacat aatgtatttc tttaaaacct 240
gtgtgaaaaa ataaatgttc caccagtagg gataggggaa aagtaaccaa aagagagaaa 300
gagaaaggaa tgctggttta tctttgtaga ttgtaatcga atggagaaat ttgcagtatt 360
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tttcatganc ctggtttgaa acggtaggaa agcaccaaaa cgngggancc tggggactaa 480
gggcctgggt caaggacttg ggaaatggca ttgataatan atgggggggt tttccccct 540
ttaaaaatgt tggatnttaa gggatataac ccttntttta ctccgaaaat nttntgagaa 600
atcccaaaat tcncggtatg cttggaacca ttganatttt ntagggaaan gccttgaata 660
gcctanacct caaagttggn gngaaccaa atttgagccn ttgncccacc tcc 713

```

<210> 22  
 <211> 480  
 <212> DNA  
 <213> Homo sapiens

```

<400> 22
cggcacgaga agaagtggta caggaggaat ttgtgatgat gagctgatct taatcaaaaa 60
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tgagatggag cgctctttac atgatgcact ttgtgtagtg aagagagttt tggagtcaaa 180
atctgtggtt cccggtgggg gtgctgtaga agcagccctt tccatatacc ttgaaaacta 240
tgcaaccagc atgggggtctc ggggaacagct tgcgattgca gagtttgcaa gatcacttct 300
tggtattccc aatacactag cagttaatgc tgcccaggac tccacagatc tggttgcaaa 360
attaagagct tttcataatg agggccaggt taaccagaa cgtaaaaatc taaaatgatt 420
ggtcttgatt tgagcaatgg taaacctcga gggggggccc ggtacccaat tcgccctata 480

```

<210> 23  
 <211> 198  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 21  
 <223> a or c or g or t

```

<400> 23
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tctttgttta acaaacctatg catttaagtt taagtgaagt caacaaaaag gaaataggtg 120
tatggatatg tgattttgag attaaagtta gtcttaaaat gtaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaaaaa

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<210> 24  
<211> 414  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 368, 370, 372, 374, 375, 376, 377 383, 386, 389  
<223> a or c or g or t

<400> 24  
aattcggcac gagaaaagca gtataactgc ctgacacagc gggattgaac gagagaagaa 60  
attgttcggt attgttcaga aaattcaaac acgcaaagat cttatggata aaactcagaa 120  
agtgaagggtg aagaaagaaa cgggtgaactc cccagctatt tataaatttc agagtcgtcg 180  
aaaacggttg cgtgttatag ataagccttg tcattctgta tcaaaaatct gttgtcgttt 240  
tctagtaact tcaaattcca ttactccaaa tggcatgggtt ttccggtttg taaccataac 300  
taaattgtca gtctgacatt taatgtcttt ctatggacaa cattaaatct cctcccttc 360  
tgtagaanan anannnnaaa aanccnccng gggggggccg ggtccccatt cccc 414

<210> 25  
<211> 367  
<212> DNA  
<213> Homo sapiens

<400> 25  
aattcggcac gagaaaagca gtataactgc ctgacacagc gggattgaac gagagaagaa 60  
attgttcggt attgttcaga aaattcaaac acgcaaagat cttatggata aaactcagaa 120  
agtgaagggtg aagaaagaaa cgggtgaactc cccagctatt tataaatttc agagtcgtcg 180  
aaaacggttg cgtgttatag ataagccttg tcattctgta tcaaaaatct gttgtcgttt 240  
tctagtaact tcaaattcca ttactccaaa tggcatgggtt ttccggtttg taaccataac 300  
taaattgtca gtctgacatt taatgtcttt ctatgggaca acattaaatc tccctccctt 360  
ctgtaaa 367

<210> 26  
<211> 432  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 386, 389, 390, 397, 404, 409, 413, 416, 424, 426, 430  
<223> a or c or g or t

<400> 26  
aattcggcac gaggcagact tgaaacagtt ctgtctgcag aatgctcaac atgaccctct 60  
gctgactgga gtatcttcaa gtacaaatcc cttcagacc cagaaagtct gttccttttt 120  
gtagtaaaat gaatctttca aagggtttccc aaaccactcc ttatgatcca gtgaatattc 180  
aagagagcta catttgaaagc ctgtacaaaa gcttatccct gtaacacatg tgccataata 240  
tacaaacttc tactttcgtc agtccttaac atctacctct ctgaattttc atgaattttc 300  
atttcacaag ggtaattggt ttatatacac tggcagcagc atacaataaa acttagtatg 360  
aaactttaaa aaaaaaaaaa aaaacntcnn ggggggnccc ggancccant tcncntata 420  
ggngnccgn tt 432

<210> 27  
<211> 398  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 288, 298, 345, 348, 352, 357, 358, 368  
<223> a or c or g or t

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<400> 27  
aattcggcac gagtacaaaa ccagttggtg gtgacaagaa cggcgggtacc cgggtggtta 60  
aacttcgcaa aatgcctaga tattatccta ctgaagatgt gcctcgaaaag ctgttgagcc 120  
acggcaaaaa acccttcagt cagcacgtga gaaaactgcg agccagcatt acccccggga 180  
ccattctgat catcctcact ggacgccaca ggggcaagag ggtggttttc ctgaagcagc 240  
tggctagtgg cttattactt gtgactggac ctctggtcct caatcgantt cctctacnaa 300  
gaacacacca gaaatttgtc attgccactt caaccaaatt cgatntcngc antgtannaa 360  
atcccaanac atcttactga tgcttacttc aagatgaa 398

<210> 28  
<211> 232  
<212> DNA  
<213> Homo sapiens

<400> 28  
aattcggcac gagattgtat cggttttata ttacctgttc tgcttcacca ggagatcatg 60  
ctgctgtgat actgagtttt ctaaacagca taaggaagac ttgctcccct gtcctatgaa 120  
agagaatagt tttggagggg agaaagtggga caaaaaagat gcagttttcc tttgtattgg 180  
gaaatgtgaa aataaaaattg tcaactcttt caaaaaaaaaa aaaaaaaaaa aa 232

<210> 29  
<211> 539  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 495, 508, 511, 526, 529  
<223> a or c or g or t

<400> 29  
aattcggcac gagcacaacc agaaagtaag gtgttctact tgaaaaatgaa aggagattat 60  
tttaggtatc tttctgaagt ggcattctgga gacaacaaac aaaccactgt gtcgaactcc 120  
cagcaggctt accaggaagc atttgaaatt agtaagaaaag aaatgcagcc tacacaccca 180  
attcgtcttg gtctggcact aaattttctca gtcttttact atgagattct aaactctcct 240  
gaaaaggcct gtagcctggc aaaaacggca ttgatgaag caattgctga attggatacg 300  
ctgaatgaag agtcttataa agacagcact ctgatcatgc agttacttag ggacaattca 360  
ctctgtggac atcggaaaac cagggagacg aaggagacgc tggggaggga gagaactaat 420  
gtttctcgtg ctttgtgatc tgttcagtg cactctgtac cctcaacata tatcccttgt 480  
gcgataaaaa aaaanaaaaa aaaaaccntc ngggggggcc ccggancccn attccccct 539

<210> 30  
<211> 568  
<212> DNA  
<213> Homo sapiens

<220>  
<221> unsure  
<222> 274, 278, 283, 291, 308, 314, 324, 326, 327, 331, 341, 355,  
371, 419, 461, 531, 534, 545, 558  
<223> a or c or g or t

<400> 30  
attccaaacc aagtagtggtc tgtcagccct cttaactctg tgcacgccct atttcagtct 60  
tttacatttg ttcttctagg gaatgtatgc atctctatat atattttccc tctcaaaacc 120  
agaacatcaa cagtgtctgtt tctgacactt cagacatccc acgcaaagcc acattgaatt 180  
tttgccaaat gaaaaacaca tccacaatca agttctaaga ggggtgtcaag tgggggaatt 240  
taatattgtt tattattcaa aaatttagtt tatnaaangg aancaaaacc ntigaacctt 300  
ttttcccnaa aaanaaggaa aatntnntgt ngaccaaggg nccaacctga atccnccttg 360  
aaaaattgtt ntctcagaaa ggaaaagcgc cctccagttc ttttacccca agaatttana 420  
aaaatttggg ccaagatttt atatgttcag ttgtttatgt ntaaaaaataa ctttctggat 480  
tttgtggggg aggaccggaa aaggaaggga gttatttctt atgttatata ntanaaactt 540

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ccccnataaa atgccatnga tgggttga 568

<210> 31  
 <211> 315  
 <212> DNA  
 <213> Homo sapiens

<400> 31  
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 ccaaaaaagg aggtggctct aagtaaaaact gggattggac agtagtggg catctgggtcc 120  
 ttgccgcctg agagccccag gagacatcgg ctagagtgc catggctatg ctcccgtctg 180  
 gaagatgccg gcatctggcc tcccactgtt ttcagctgtg tccccagtc cgtgtctttt 240  
 tagaatgtga atgatgataa agttgtgaaa taaagggttc tatctagtt gtataaaaaa 300  
 aaaaaaaaaa aaaaa 315

<210> 32  
 <211> 458  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 342, 355, 365, 368, 375, 381, 385, 414, 445  
 <223> a or c or g or t

<400> 32  
 aattcaagga actttacatt gtaagagaaa acaaaacact gcaaaagaag tgtgccgact 60  
 atcaaaataaa tgggtgaaatc atctgcaaat gtggccaggc ttggggaaca atgatgggtgc 120  
 acaaaggctt agatttgctt tgtctcaaaa taagggaattt tgtagtgggtt ttcaaaaaata 180  
 attcaacaaa gaaacaatac aaaaagtggg tagaattacc tatcacattt cccaatcttg 240  
 actattcaga atgctgttta tttagtgtatg aggattagca cttgattgaa gattctttta 300  
 aaatactatc agttaaacat ttaatatgat tatgattaat gnattcatta tgctncagac 360  
 tgacntanga atcantaaaa ngatngtttt actctgcaaa aaaaaaaaaa aacncggggg 420  
 ggggcccggc cccaatttcc ccttntgggg ggggggtt 458

<210> 33  
 <211> 470  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 434, 459, 460  
 <223> a or c or g or t

<400> 33  
 aattcttatc ttccagaggc tacaattatt ataatggaca atactttttac ctttgtctct 60  
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 gaccgagctt tgttgtttag cctaagagaa gatttatgta gtaatttctt ctcagggtatg 180  
 gaaccacggt cataactaac atgttggcca gaatagaacc actggttaaa catattttat 240  
 tcaccattaa gtgatcttta tcaatatctt ggattagaca acaaattacc tttctgggtg 300  
 tttcttgtaa actatactcc tgtttgaatg ttaaactttg ttgctaaagt ttaattttaa 360  
 gatgtttgaa tgttcagttt atgtatttga actacaataa accaaccctt tttatataaa 420  
 aaaaaaaaaa aacntcgagg gggggcccgg cccaattnn ccctataggg 470

<210> 34  
 <211> 261  
 <212> DNA  
 <213> Homo sapiens

<400> 34  
 aattcgaact gtgtgtatgt cagtggaaac aaatcaaaaag ccactaacat ggctgtctgt 60  
 ttcactggac tgtcccatat gctgggttaa aggattgggg cccaatcct ctggcctagc 120

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atttctcagt gtttgctatt cagactgtct aaatacagca tgtgacaagc tgaagaagcc 180  
 aaatctagca gtcatttctg atttcattat attctccccc tcttcctgct aaaaagacaa 240  
 aaaacaaaaa aaaaaaaaaa a 261

<210> 35  
 <211> 309  
 <212> DNA  
 <213> Homo sapiens

<400> 35  
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 tctgattggg ggcctagcta tggcttgcca tgactccttc ctcaaggctg tcccttccca 120  
 gaagcggacc tgaggacccc ttggccctgg ccttcaaacc ccccccttt ccttccagcc 180  
 tttctgtcat catctccaca gcccacccat cccctgagca cactaaccac ctcatgcagg 240  
 cccacctgc caatagtaat aaagcaatgt cactttttta aaacatgaaa aaaaaaaaaa 300  
 aaaaaaaaaa 309

<210> 36  
 <211> 243  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 8  
 <223> a or c or g or t

<400> 36  
 aattcggntc gagctcgaat aagtttgact tgtgttttat cttaaccacc agatcattcc 60  
 ttctgtagct caggagagca cccctccacc ccatttgctc gcagtatcct agaattcttg 120  
 tgctctcgct gcagtccct ttgggttcca tgttttcctt gttccctccc atgccttagct 180  
 ggattgcaga gttaagttaa tgattatgaa ataaaaacta aataacaaaa aaaaaaaaaa 240  
 aaa 243

<210> 37  
 <211> 650  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 546, 553, 573  
 <223> a or c or g or t

<400> 37  
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 ttccgtgtga acttgctgc agaaccagc gtgctttgaa gcaatgttgt gggacactac 120  
 cacaagcccc ttctggaaaag gatgcagaaa agaccccagc agttagcatt tcttgtttag 180  
 aacttagtaa caatctagag aagaagccca ggaggactaa agctgaaaac atccctgctg 240  
 ttgtgataga gattaaaaac atgccaaaca aacaacctga atcatctttg tgagtcttga 300  
 aaaagatgtg atatttgact ttgtctttaa actgcaagag gaaaaagact ccactgaaat 360  
 tctaagtgtg ccaagtagtg taattgaagt ccttgtctgg tcacacagtt taattctatt 420  
 tttgtaagaa cataatggga ctgcataaca gagttctata ttacaatttt gtgattatta 480  
 gtacagagta cagctatgct gtgactgttt tggaaagcca gttttaacac tatgttacat 540  
 ttttgnttaa agnaagttaa accttatata acntaatgac atttgatttc tggattttcc 600  
 catgataaaa aattaggggg gataaataaa aatggttact ggaatttcaa 650

<210> 38  
 <211> 687  
 <212> DNA  
 <213> Homo sapiens

<220>

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<221> unsure  
 <222> 444, 448, 451, 460, 461, 462, 468, 471, 476, 490, 506, 510,  
 514, 522, 524, 535, 550, 563, 567, 568, 573, 579, 587, 590  
 <223> a or c or g or t

<221> unsure  
 <222> 592, 593, 596, 608, 615  
 <223> a or c or g or t

<400> 38  
 gaattcggca cgagatTTTT ttatttttca ttttcccctt aggcataTTT agtattttttc 60  
 cctcaggcag atcatttctga gtgtgCGagt gtgtgtgcac atgttacaaa ggcaactacc 120  
 atgttaataa aatatttcaat ttgaaatcct tttcgggtatt tgaattgctt ttgaataatg 180  
 ttttttatct ggatgtaaca ttgttgcaatt agcttttttaa ctttcccaag taattgaata 240  
 cattttatta cttggacttt tataaactct ttccctaccc actataaatg agacattcac 300  
 agcgttcaag ttigtatttaa aggaaaaggat tagtttgacc ctttcttttg atgggttaatg 360  
 catacatgca gttaaattccc tttatgcaaa tgtgacactg ctttactagg tcttttagtt 420  
 atttatttat tttttttttt ttgnccantt natTTTTtan nntaatttnt naaacncatt 480  
 attttttttt aaaataaaaa aacacnattcn tttnttttta ananttaaAC cttantaaat 540  
 ttttcccccn aaaaaaaatc ccntaanntt ttnaatttnt tgaattnaan annaantaaa 600  
 ctttttttaa aaccnggcaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 660  
 aaaaaaaaaa aaaaaaaaaa aaaaaaa 687

<210> 39  
 <211> 2549  
 <212> DNA  
 <213> Homo sapiens

<400> 39  
 gatggctcctt tcctttctgcc acggcgggat cgggcactca cccagttgca agtgcgagca 60  
 ctatggagta gcgcaggggtc tcgagctgtg gccgtggact taggcaacag gaaattagaa 120  
 atatcttctg gaaagctggc cagattttgca gatggctctg ctgtagtaca gtcagggtgac 180  
 actgcagtaa tggtcacagc ggtcagtaaa acaaaacctt ccccttccca gtttatgcct 240  
 ttggtgggtg actacagaca aaaagctgtg gcagcaggta gaattccac aaactatctg 300  
 agaagagagg ttggtacttc tgataaagaa attctaaca gtcgaataat agatcgttca 360  
 attagaccgc tctttccagc tggctacttc tatgatacac aggttctgtg taatctgtta 420  
 gcagtagatg gtgtaaatga gcctgatgtc ctagcaatta atggcgcttc cgtagccctc 480  
 tcattatcag atattccttg gaatggacct gttggggcag tacgaatagg aataattgat 540  
 ggagaatatg ttgttaaccc aacaagaaaa gaaatgtctt ctagtacttt aaatttagtg 600  
 gttgctggag caccctaaaag tcagattgtc atgttggaag cctctgcaga gaacatttta 660  
 cagcaggact tttgccatgc tatcaaagtg ggagtgaat ataccaca aataattcag 720  
 ggcattcagc agttggtaaa agaaactggg gttaccaaga ggacacctca gaagttattt 780  
 accccttcgc cagagattgt gaaatatact cataaacttg ctatggagag actctatgca 840  
 gtttttacag attacgagca tgacaaagtt tccagagatg aagctgttaa caaaataaga 900  
 ttagatacgg aggaacaact aaaagaaaaa tttccagaag ccgatccata tgaaataata 960  
 gaatccttca atgttgttg aaagggaagt tttagaagta ttgttttgaa tgaatacaaa 1020  
 aggtgCGatg gtcgggattt gacttcactt aggaatgtaa gttgtgaggt agatatgttt 1080  
 aaaacccttc atggatcagc attatttcaa agaggacaaa cacagggtgct ttgtaccgtt 1140  
 acatttgatt cattagaatc tgggtattaag tcagatcaag ttataacagc tataaatggg 1200  
 ataaaagata aaaatttcat gctgcactac gagtttcctc cttatgcaac taatgaaatt 1260  
 ggcaagtc ctggttttaa tagaagagaa cttgggcatg gtgctcttgc tgagaaagct 1320  
 ttgtatcctg ttatttcccag agattttcct ttcaccataa gagttacatc tgaagtccta 1380  
 gagtcaaatg ggtcatcttc tatggcatct gcatgtggcg gaagtttagc attaatggat 1440  
 tcaggggttc caatttcac tgctgttgca ggcgtagcaa taggattggc caccaaaacc 1500  
 gatcctgaga aggggtgaaat agaagattat cgtttgctga cagatatatt gggaattgaa 1560  
 gattacaatg gtgacatgga cttcaaaata gctggcacta ataaaggaat aactgcatta 1620  
 caggctgata ttaaattacc tggaaatacca ataaaaattg tgatggaggc tattcaacaa 1680  
 gcttcagttg caaaaaagga gatattacag atcatgaaca aaactatttc aaaacctcga 1740  
 gcatctagaa aagaaaatgg acctgttgta gaaactgttc aggttccatt atcaaaacga 1800  
 gcaaaatttg ttggacctgg tggctataac ttaaaaaaac ttcaggctga aacagggtga 1860  
 actattagtc aggtggatga agaaacgttt tctgtatttg caccaacacc cagtgttatg 1920  
 catgaggcaa gagacttcat tactgaaatc tgcaaggatg atcaggagca gcaattagaa 1980  
 tttggagcag tatataccgc cacaataact gaaatcagag atactgggtg aatggtaaaa 2040

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```

ttatatccaa atatgactgc ggtactgctt cataacacac aacttgataa cgaaagatta 2100
aacatcctac tgcccttagga ttagaagttg gccagaaat tcaggtgaaa tactttggac 2160
gtgacccagc cgatggaaga atgaggcttt ctcgaaaagt gcttcagtcg ccagctacaa 2220
ccgtgggtcag aactttgaat gacagaagta gtattgtaat gggagaacct atttcacagt 2280
catcatctaa ttctcagtga tttttttttt ttaaagagaa ttctagaatt ctattttgtc 2340
taggggtgatg tgctgtagag caacatttta gtagatcttc cattgtgtag atttctatat 2400
aatataaata cattttaatt atttgtacta aaatgctcat ttacatgtgc catTTTTTTT 2460
attcgagtaa cccatatttg ttttaattga ttacattat aaatcaagaa atatttatta 2520
ttaaagtaa gtcatttata catcttaga 2549

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<210> 40  
 <211> 650  
 <212> DNA  
 <213> Homo sapiens

```

<400> 40
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cattacaggc tgatattaaa ttacctggaa taccaataaa aattgtgatg gaggctattc 120
aacaagcttc agtggcaaaa aaggagatat tacagatcat gaacaaaact atttcaaaac 180
ctcgagcatc tagaaaagaa aatggacctg ttgtagaaac tggtcaggtt ccattatcaa 240
aacgagcaaa atttgttggg cctgggtggc ataacttaaa aaaacttcag gctgaaacag 300
gtgtaacctat tagtcagggtg gatgaagaaa cgttttctgt atttgacca acacccagtg 360
ttatgcatga ggcaagaaga cttcattact gaatctgcaa ggatgatcag gaggcagcaat 420
tagaatttgg agcagtatat accgccacaa taactgaaat cagagatact ggtgtaatgg 480
taaaattata tccaaatatg actgcggtac tgcttcataa cacacaactt gataacgaaa 540
gattaaacat cctactgccc taggattaga agttggccaa gaaattcagg tgaataactt 600
tggacgtgac ccagccgatg gaagaatgag gctttctcga aaagtgcctc 650

```

<210> 41  
 <211> 640  
 <212> DNA  
 <213> Mus musculus

```

<400> 41
aatggtgaca tggatttcaa aatagccggt acaataaag gaataactgc attacaggct 60
gatattaagt tacctggagt accaattaaa attataatgg aagccatcca acaagcgtca 120
gtggcaaaaga aggagatact gcagataatg acaaaaacga ttcaaaaacc tcgagcatca 180
agaaaagaaa atggaccagt ttagaagaaa gtaaagggtc cattatcaaa acgagcaaaa 240
ttcgttgggc ctggtggata tcacttaaaa aaactccagg ctgagacagg tgtaacaatt 300
agtcagggtg atgaagaaac cttctccata ttgaccaa cactactgc aatgcatgaa 360
gcaagagatt tcattacaga aatttgcaga gatgatcaag agcaacaatt agaatttggg 420
gcagtttata ccgcgacaat aactgaaatc agagacactg gagtgatggg aaaactgtat 480
ccaaacatga ctgcagtgtc gcttcataat tcacaacttg accaacgaaa gattaaacat 540
cccactgccc taggactaga gggtggccaa gaaattcagg tcaaatactt tggccgtgat 600
ccagctgatg gaagaatgag gctttctcgt aaagtacttc 640

```

<210> 42  
 <211> 705  
 <212> PRT  
 <213> Homo sapiens

```

<400> 42
Asp Gly Pro Phe Leu Leu Pro Arg Arg Asp Arg Ala Leu Thr Gln Leu
1      5      10      15
Gln Val Arg Ala Leu Trp Ser Ser Ala Gly Ser Arg Ala Val Ala Val
20     25     30
Asp Leu Gly Asn Arg Lys Leu Glu Ile Ser Ser Gly Lys Leu Ala Arg
35     40     45
Phe Ala Asp Gly Ser Ala Val Val Gln Ser Gly Asp Thr Ala Val Met
50     55     60
Val Thr Ala Val Ser Lys Thr Lys Pro Ser Pro Ser Gln Phe Met Pro
65     70     75     80
Leu Val Val Asp Tyr Arg Gln Lys Ala Ala Ala Gly Arg Ile Pro

```

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Val Gln Val Pro Leu Ser Lys Arg Ala Lys Phe Val Gly Pro Gly Gly  
 595 600 605  
 Tyr Asn Leu Lys Lys Leu Gln Ala Glu Thr Gly Val Thr Ile Ser Gln  
 610 615 620  
 Val Asp Glu Glu Thr Phe Ser Val Phe Ala Pro Thr Pro Ser Val Met  
 625 630 635 640  
 His Glu Ala Arg Asp Phe Ile Thr Glu Ile Cys Lys Asp Asp Gln Glu  
 645 650 655  
 Gln Gln Leu Glu Phe Gly Ala Val Tyr Thr Ala Thr Ile Thr Glu Ile  
 660 665 670  
 Arg Asp Thr Gly Val Met Val Lys Leu Tyr Pro Asn Met Thr Ala Val  
 675 680 685  
 Leu Leu His Asn Thr Gln Leu Asp Asn Glu Arg Leu Asn Ile Leu Leu  
 690 695 700  
 Pro  
 705

<210> 43

<211> 705

<212> PRT

<213> Bacillus subtilis

<400> 43

Met Gly Gln Glu Lys His Val Phe Thr Ile Asp Trp Ala Gly Arg Thr  
 1 5 10 15  
 Leu Thr Val Glu Thr Gly Gln Leu Ala Lys Gln Ala Asn Gly Ala Val  
 20 25 30  
 Met Ile Arg Tyr Gly Asp Thr Ala Val Leu Ser Thr Ala Thr Ala Ser  
 35 40 45  
 Lys Glu Pro Lys Pro Leu Asp Phe Phe Pro Leu Thr Val Asn Tyr Glu  
 50 55 60  
 Glu Arg Leu Tyr Ala Val Gly Lys Ile Pro Gly Gly Phe Ile Lys Arg  
 65 70 75 80  
 Glu Gly Arg Pro Ser Glu Lys Ala Val Leu Ala Ser Arg Leu Ile Asp  
 85 90 95  
 Arg Pro Ile Arg Pro Leu Phe Ala Asp Gly Phe Arg Asn Glu Val Gln  
 100 105 110  
 Val Ile Ser Ile Val Met Ser Val Asp Gln Asn Cys Ser Ser Glu Met  
 115 120 125  
 Ala Ala Met Phe Gly Ser Ser Leu Ala Leu Ser Val Ser Asp Ile Pro  
 130 135 140  
 Phe Glu Gly Pro Ile Ala Gly Val Thr Val Gly Arg Ile Asp Asp Gln  
 145 150 155 160  
 Phe Ile Ile Asn Pro Thr Val Asp Gln Leu Glu Lys Ser Asp Ile Asn  
 165 170 175  
 Leu Val Val Ala Gly Thr Lys Asp Ala Ile Asn Met Val Glu Ala Gly  
 180 185 190  
 Ala Asp Glu Val Pro Glu Glu Ile Met Leu Glu Ala Ile Met Phe Gly  
 195 200 205  
 His Glu Glu Ile Lys Arg Leu Ile Ala Phe Gln Glu Glu Ile Val Ala  
 210 215 220  
 Ala Val Gly Lys Glu Lys Ser Glu Ile Lys Leu Phe Glu Ile Asp Glu  
 225 230 235 240  
 Glu Leu Asn Glu Lys Val Lys Ala Leu Ala Glu Glu Asp Leu Leu Lys  
 245 250 255  
 Ala Ile Gln Val His Glu Lys His Ala Arg Glu Asp Ala Ile Asn Glu  
 260 265 270  
 Val Lys Asn Ala Val Val Ala Lys Phe Glu Asp Glu Glu His Asp Glu  
 275 280 285  
 Asp Thr Ile Lys Gln Val Lys Gln Ile Leu Ser Lys Leu Val Lys Asn  
 290 295 300  
 Glu Val Arg Arg Leu Ile Thr Glu Glu Lys Val Arg Pro Asp Gly Arg



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```

305      310      315      320
Gly Val Asp Gln Ile Arg Pro Leu Ser Ser Glu Val Gly Leu Leu Pro
325      330      335
Arg Thr His Gly Ser Gly Leu Phe Thr Arg Gly Gln Thr Gln Ala Leu
340      345      350
Ser Val Cys Thr Leu Gly Ala Leu Gly Asp Val Gln Ile Leu Asp Gly
355      360      365
Leu Gly Val Glu Glu Ser Lys Arg Phe Met His His Tyr Asn Phe Pro
370      375      380
Gln Phe Ser Val Gly Glu Thr Gly Pro Met Arg Gly Pro Gly Arg Arg
385      390      395      400
Glu Ile Gly His Gly Ala Leu Gly Glu Arg Ala Leu Glu Pro Val Ile
405      410      415
Pro Ser Glu Lys Asp Phe Pro Tyr Thr Val Arg Leu Val Ser Glu Val
420      425      430
Leu Glu Ser Asn Gly Ser Thr Ser Gln Ala Ser Ile Cys Ala Ser Thr
435      440      445
Leu Ala Met Met Asp Ala Gly Val Pro Ile Lys Ala Pro Val Ala Gly
450      455      460
Ile Ala Met Gly Leu Val Lys Ser Gly Glu His Tyr Thr Val Leu Thr
465      470      475      480
Asp Ile Gln Gly Met Glu Asp Ala Leu Gly Asp Met Asp Phe Lys Val
485      490      495
Ala Gly Thr Glu Lys Gly Val Thr Ala Leu Gln Met Asp Ile Lys Ile
500      505      510
Glu Gly Leu Ser Arg Glu Ile Leu Glu Glu Ala Leu Gln Gln Ala Lys
515      520      525
Lys Gly Arg Met Glu Ile Leu Asn Ser Met Leu Ala Thr Leu Ser Glu
530      535      540
Ser Arg Lys Glu Leu Ser Arg Tyr Ala Pro Lys Ile Leu Thr Met Thr
545      550      555      560
Ile Asn Pro Asp Lys Ile Arg Asp Val Ile Gly Pro Ser Gly Lys Gln
565      570      575
Ile Asn Lys Ile Ile Glu Glu Thr Gly Val Lys Ile Asp Ile Glu Gln
580      585      590
Asp Gly Thr Ile Phe Ile Ser Ser Thr Asp Glu Ser Gly Asn Gln Lys
595      600      605
Ala Lys Lys Ile Ile Glu Asp Leu Val Arg Glu Val Glu Val Gly Gln
610      615      620
Leu Tyr Leu Gly Lys Val Lys Arg Ile Glu Lys Phe Gly Ala Phe Val
625      630      635      640
Glu Ile Phe Ser Gly Lys Asp Gly Leu Val His Ile Ser Glu Leu Ala
645      650      655
Leu Glu Arg Val Gly Lys Val Glu Asp Val Val Lys Ile Gly Asp Glu
660      665      670
Ile Leu Val Lys Val Thr Glu Ile Asp Lys Gln Gly Arg Val Asn Leu
675      680      685
Ser Arg Lys Ala Val Leu Arg Glu Glu Lys Glu Lys Glu Glu Gln Gln
690      695      700
Ser
705

```

<210> 44  
 <211> 705  
 <212> PRT  
 <213> Homo sapiens

```

<400> 44
Asp Gly Pro Phe Leu Leu Pro Arg Arg Asp Arg Ala Leu Thr Gln Leu
1      5      10      15
Gln Val Arg Ala Leu Trp Ser Ser Ala Gly Ser Arg Ala Val Ala Val
20      25      30

```

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Asp	Leu	Gly	Asn	Arg	Lys	Leu	Glu	Ile	Ser	Ser	Gly	Lys	Leu	Ala	Arg
		35					40					45			
Phe	Ala	Asp	Gly	Ser	Ala	Val	Val	Gln	Ser	Gly	Asp	Thr	Ala	Val	Met
	50					55					60				
Val	Thr	Ala	Val	Ser	Lys	Thr	Lys	Pro	Ser	Pro	Ser	Gln	Phe	Met	Pro
	65				70					75					80
Leu	Val	Val	Asp	Tyr	Arg	Gln	Lys	Ala	Ala	Ala	Ala	Gly	Arg	Ile	Pro
				85					90					95	
Thr	Asn	Tyr	Leu	Arg	Arg	Glu	Val	Gly	Thr	Ser	Asp	Lys	Glu	Ile	Leu
			100					105					110		
Thr	Ser	Arg	Ile	Ile	Asp	Arg	Ser	Ile	Arg	Pro	Leu	Phe	Pro	Ala	Gly
		115					120					125			
Tyr	Phe	Tyr	Asp	Thr	Gln	Val	Leu	Cys	Asn	Leu	Leu	Ala	Val	Asp	Gly
	130					135					140				
Val	Asn	Glu	Pro	Asp	Val	Leu	Ala	Ile	Asn	Gly	Ala	Ser	Val	Ala	Leu
	145				150					155					160
Ser	Leu	Ser	Asp	Ile	Pro	Trp	Asn	Gly	Pro	Val	Gly	Ala	Val	Arg	Ile
				165				170						175	
Gly	Ile	Ile	Asp	Gly	Glu	Tyr	Val	Val	Asn	Pro	Thr	Arg	Lys	Glu	Met
			180					185					190		
Ser	Ser	Ser	Thr	Leu	Asn	Leu	Val	Val	Ala	Gly	Ala	Pro	Lys	Ser	Gln
		195					200					205			
Ile	Val	Met	Leu	Glu	Ala	Ser	Ala	Glu	Asn	Ile	Leu	Gln	Gln	Asp	Phe
	210					215					220				
Cys	His	Ala	Ile	Lys	Val	Gly	Val	Lys	Tyr	Thr	Gln	Gln	Ile	Ile	Gln
	225				230					235					240
Gly	Ile	Gln	Gln	Leu	Val	Lys	Glu	Thr	Gly	Val	Thr	Lys	Arg	Thr	Pro
				245					250					255	
Gln	Lys	Leu	Phe	Thr	Pro	Ser	Pro	Glu	Ile	Val	Lys	Tyr	Thr	His	Lys
			260					265					270		
Leu	Ala	Met	Glu	Arg	Leu	Tyr	Ala	Val	Phe	Thr	Asp	Tyr	Glu	His	Asp
		275					280					285			
Lys	Val	Ser	Arg	Asp	Glu	Ala	Val	Asn	Lys	Ile	Arg	Leu	Asp	Thr	Glu
	290					295					300				
Glu	Gln	Leu	Lys	Glu	Lys	Phe	Pro	Glu	Ala	Asp	Pro	Tyr	Glu	Ile	Ile
	305				310					315					320
Glu	Ser	Phe	Asn	Val	Val	Ala	Lys	Glu	Val	Phe	Arg	Ser	Ile	Val	Leu
				325					330					335	
Asn	Glu	Tyr	Lys	Arg	Cys	Asp	Gly	Arg	Asp	Leu	Thr	Ser	Leu	Arg	Asn
			340					345					350		
Val	Ser	Cys	Glu	Val	Asp	Met	Phe	Lys	Thr	Leu	His	Gly	Ser	Ala	Leu
		355					360					365			
Phe	Gln	Arg	Gly	Gln	Thr	Gln	Val	Leu	Cys	Thr	Val	Thr	Phe	Asp	Ser
	370					375					380				
Leu	Glu	Ser	Gly	Ile	Lys	Ser	Asp	Gln	Val	Ile	Thr	Ala	Ile	Asn	Gly
	385				390					395					400
Ile	Lys	Asp	Lys	Asn	Phe	Met	Leu	His	Tyr	Glu	Phe	Pro	Pro	Tyr	Ala
				405					410					415	
Thr	Asn	Glu	Ile	Gly	Lys	Val	Thr	Gly	Leu	Asn	Arg	Arg	Glu	Leu	Gly
			420					425					430		
His	Gly	Ala	Leu	Ala	Glu	Lys	Ala	Leu	Tyr	Pro	Val	Ile	Pro	Arg	Asp
		435					440					445			
Phe	Pro	Phe	Thr	Ile	Arg	Val	Thr	Ser	Glu	Val	Leu	Glu	Ser	Asn	Gly
	450					455					460				
Ser	Ser	Ser	Met	Ala	Ser	Ala	Cys	Gly	Gly	Ser	Leu	Ala	Leu	Met	Asp
	465				470					475				480	
Ser	Gly	Val	Pro	Ile	Ser	Ser	Ala	Val	Ala	Gly	Val	Ala	Ile	Gly	Leu
				485					490					495	
Val	Thr	Lys	Thr	Asp	Pro	Glu	Lys	Gly	Glu	Ile	Glu	Asp	Tyr	Arg	Leu
			500					505					510		
Leu	Thr	Asp	Ile	Leu	Gly	Ile	Glu	Asp	Tyr	Asn	Gly	Asp	Met	Asp	Phe
		515					520					525			
Lys	Ile	Ala	Gly	Thr	Asn	Lys	Gly	Ile	Thr	Ala	Leu	Gln	Ala	Asp	Ile

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```

530          535          540
Lys Leu Pro Gly Ile Pro Ile Lys Ile Val Met Glu Ala Ile Gln Gln
545          550          555          560
Ala Ser Val Ala Lys Lys Glu Ile Leu Gln Ile Met Asn Lys Thr Ile
565          570          575
Ser Lys Pro Arg Ala Ser Arg Lys Glu Asn Gly Pro Val Val Glu Thr
580          585          590
Val Gln Val Pro Leu Ser Lys Arg Ala Lys Phe Val Gly Pro Gly Gly
595          600          605
Tyr Asn Leu Lys Lys Leu Gln Ala Glu Thr Gly Val Thr Ile Ser Gln
610          615          620
Val Asp Glu Glu Thr Phe Ser Val Phe Ala Pro Thr Pro Ser Val Met
625          630          635          640
His Glu Ala Arg Asp Phe Ile Thr Glu Ile Cys Lys Asp Asp Gln Glu
645          650          655
Gln Gln Leu Glu Phe Gly Ala Val Tyr Thr Ala Thr Ile Thr Glu Ile
660          665          670
Arg Asp Thr Gly Val Met Val Lys Leu Tyr Pro Asn Met Thr Ala Val
675          680          685
Leu Leu His Asn Thr Gln Leu Asp Asn Glu Arg Leu Asn Ile Leu Leu
690          695          700
Pro
705

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<210> 45  
 <211> 245  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Consensus sequence between Homo sapiens OLD-35 and  
 Bacillus subtilis PNPase

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<400> 45
Asp Arg Leu Gly Leu Ala Ala Gly Gly Asp Thr Ala Val Thr Ala Pro
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20     25     30
Arg Ile Asp Arg Ile Arg Pro Leu Phe Gly Gln Val Val Asp Ala Gly
35     40     45
Ser Ala Leu Ser Ser Asp Ile Gly Pro Val Gly Ile Asp Asn Pro Thr
50     55     60
Ser Asn Leu Val Val Ala Gly Lys Ile Met Glu Ala Ala Ala Ile Gly
65     70     75     80
Ile Val Gly Lys Lys Leu Phe Glu Leu Ala Glu Leu Glu Lys Glu Val
85     90     95
Glu Val Arg Ile Glu Arg Asp Gly Arg Arg Ser Glu Val His Gly Ser
100    105    110
Leu Phe Arg Gly Gln Thr Gln Leu Thr Leu Asp Lys Phe Met His Tyr
115    120    125
Phe Pro Glu Gly Gly Arg Arg Glu Gly His Gly Ala Leu Glu Ala Leu
130    135    140
Pro Val Ile Pro Asp Phe Pro Thr Arg Ser Glu Val Leu Glu Ser Asn
145    150    155    160
Gly Ser Ser Ala Ser Cys Leu Ala Met Asp Gly Val Pro Ile Val Ala
165    170    175
Gly Ala Gly Leu Val Glu Tyr Leu Thr Asp Ile Gly Glu Asp Gly Asp
180    185    190
Met Asp Phe Lys Ala Gly Thr Lys Gly Thr Ala Leu Gln Asp Ile Lys
195    200    205
Gly Ile Glu Ala Gln Gln Ala Glu Ile Leu Met Thr Ser Arg Pro Thr
210    215    220

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Lys Gly Pro Gly Lys Glu Thr Gly Val Ile Thr Ser Ala Ile Gln Leu  
 225 230 235 240  
 Gly Val Lys Leu Glu  
 245

<210> 46  
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 <212> RNA  
 <213> Homo sapiens

<400> 46  
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<210> 47  
 <211> 11  
 <212> RNA  
 <213> Homo sapiens

<400> 47  
 uuuuuuuuuu a 11

<210> 48  
 <211> 33  
 <212> RNA  
 <213> Homo sapiens

<400> 48  
 uuuuuuuuuu auuuuuuuuu uuuuuuuuuu auu 33

<210> 49  
 <211> 62  
 <212> RNA  
 <213> Homo sapiens

<400> 49  
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 uu 62

<210> 50  
 <211> 111  
 <212> RNA  
 <213> Homo sapiens

<400> 50  
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 auuuuacauu aaauuuuuuu uuuuuuuuuu aaguuuuuuu uuuuuuuuuu a 111

<210> 51  
 <211> 34  
 <212> RNA  
 <213> Homo sapiens

<400> 51  
 auuuuuuuuu uuuuuuuuuu auuuuuuuuu uuuu 34

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